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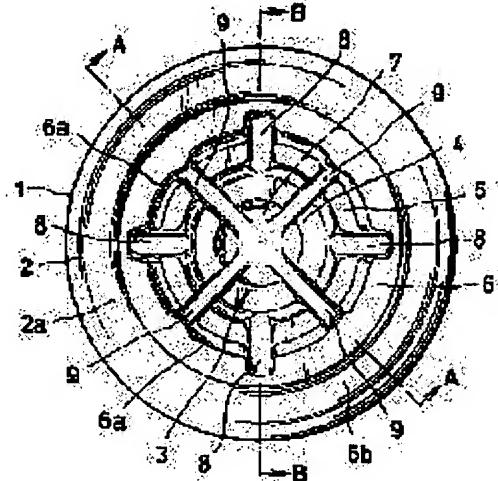
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## (54) BOTTOM STRUCTURE OF CONTAINER SUCH AS THIN SYNTHETIC RESIN BOTTLE

## (57)Abstract:

PROBLEM TO BE SOLVED: To prevent flexion due to load from occurring to the lowermost step part of a container even though the lowermost step part is formed broadly in width by providing hollow ribs alternately from the inside and the outside at a circumferential wall of a domelike bottom wall.

SOLUTION: The structure of bottom of the container is composed of a thin grounding periphery 2 connecting to a circumferential side wall 1 being integral with a drum part, and a bottom wall 3 of a domelike shape surrounded by the grounding periphery 2 and comprising of a plurality of steps formed at the circumferential wall. The top part 7 of the bottom wall 3 is formed in a thickness the same as that of an uppermost step part 4. The circumferential wall extending from the uppermost step part 4 to the grounding inner edge is formed by drawing thin, approximately same as that of the grounding periphery 2. At least three hollow outer ribs 8 relatively narrow in width are provided radially at equal intervals at parts extending from the top part 7 to an inner edge 6a of a lowermost step part 6. Hollow inner ribs 9, bigger in width than the outer ribs, extending from the uppermost step part 4 to the in-plane 6b of the lowermost step part 6 are provided between the outer ribs 8, and flexion of the lowermost step part 6 due to load can be prevented.



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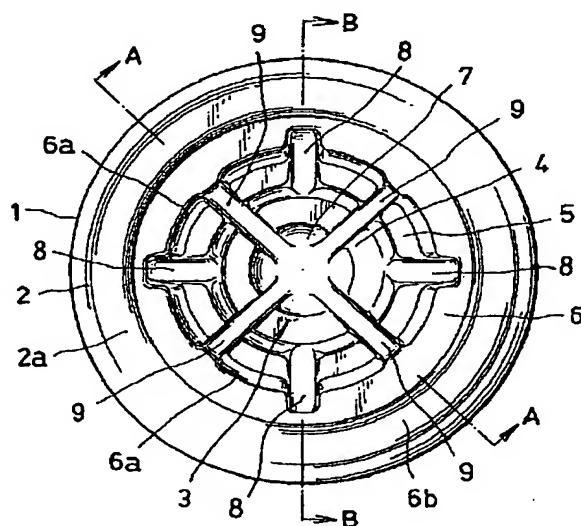
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(54)【発明の名称】 薄肉合成樹脂ボトルなどの容器の底部構造

(57)【要約】

【課題】 ドーム状の底面壁の周壁に中空のリブを内外から交互に設けることによって、最下段部が幅広に形成されても、それらのリブにより荷重による最下段部の撓みを防止する。

【解決手段】 脊部と一体の周側壁1に接続した薄肉の接地周縁2とその接地周壁2に囲繞されたドーム状でかつ周壁を複数の段部に形成した底面壁3とからなる。その底面壁3の頂部7の内厚を最上段部4まで厚内に形成する。最上段部4から接地内縁にわたる周壁を接地周縁2と略同様に薄肉に延伸形成する。頂部7から最下段部6の内縁6aに比較的幅狭の少なくとも3本の中空の外リブ8を等間隔にて放射状に設ける。各外リブ8、8の中间の周壁に該外リブよりも幅広で最上段部4から最下段部6の面内6bに達する中空の内リブ9をそれぞれ設けて、最下段部6の荷重による撓みを防止する。



## 【特許請求の範囲】

【請求項1】 胴部と一体の周側壁に接続した薄肉の接地周縁と、その接地周縁により囲繞された底面を容器内に押し入れてドーム状にかつ周壁を複数段に形成した底面壁とからなり、その底面壁の頂部肉厚を最上段部まで厚肉に形成するとともに、最上段部から接地内縁にわたる周壁を上記接地周縁と略同様に薄肉に延伸形成し、その頂部から最下段部の内縁に比較的幅狭の少なくとも3本の中空の外リブを等間隔にて放射状に設ける一方、各外リブの中間の周壁に該外リブよりも幅広で最上段部から最下段部の面内に達する中空の内リブをそれぞれ設けてなることを特徴とする薄肉合成樹脂ボトルなどの容器の底部構造。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】この発明は、延伸ブロー成形によるPETボトルなどの薄肉の合成樹脂容器の底部構造に関するものである。

## 【0002】

【発明が解決しようとする課題】延伸ブロー成形により製造されたボトルなどの薄肉の合成樹脂容器では、薄肉に延伸成形するほど強度が増すとされているが、底面壁全体を薄肉に成形することは技術的に困難とされている。また薄肉に成形できたとしても可携性を有するので、平坦面では内容物の荷重により撓んで座りが悪くなり、不安定なものとなる。

【0003】そこで、底面壁を容器内にドーム状に押し入れて接地面を環状に形成すると共に、底面壁に加わる内容物の荷重を底面周辺に分散するようしているが、ドームの盛り上がりを大きくすると底部の内容積が減少し、また周側壁と底面壁との間隔の狭まりにより、接地面から底面壁にわたる底面周辺部の薄肉成形が困難となることから、ドーム状の底面壁の形成はできるだけ小さくして底面の周辺部を薄肉に延伸成形できるようにしている。

【0004】また底面壁の薄肉化のために周壁を多段部に形成し、荷重による撓み防止として薄肉の周壁に縦リブを放射状に一体成形して補強している。このリブは底面壁の平坦に形成された最下段部の撓みをも防止するとされているが、これまでの補強リブは最下段部の内縁から最上段部あたりに形成されていることから、幅狭で接地内縁との間のスパンが短い最下段部の撓み防止には有効であっても、その効果はスパンの長さに制限を受け、幅広の最下段部で撓みを支え切れずに接地面から下側に底壁面の最下段部が飛び出すことが多い。またその撓みが接地面内で収まる範囲のものであっても、撓み分だけ内容積が増すので容器内における内容物の水位が設定水位よりも下がり、見掛け上では容量の不足を消費者に印象付けることになるので好ましいものではないとされている。

【0005】この発明は上記従来の課題を解決するものであって、その目的は、ドーム状の底面壁の周壁に中空のリブを内外から交互に設けることによって、最下段部が幅広に形成されていても、それらのリブにより荷重による撓みを防止し得る新たな薄肉合成樹脂ボトルなどの容器の底部構造を提供することにある。

## 【0006】

【課題を解決するための手段】上記目的によるこの発明は、胴部と一体の周側壁に接続した薄肉の接地周縁と、

10 その接地周縁により囲繞された底面を容器内に押し入れてドーム状にかつ周壁を複数段に形成した底面壁とからなり、その底面壁の頂部肉厚を最上段部まで厚肉に形成するとともに、最上段部から接地内縁にわたる周壁を上記接地周縁と略同様に薄肉に延伸形成し、その頂部から最下段部の内縁に比較的幅狭の少なくとも3本の中空の外リブを等間隔にて放射状に設ける一方、各外リブの中間の周壁に該外リブよりも幅広で最上段部から最下段部の面内に達する中空の内リブをそれぞれ設けてなる、といふものである。

20 【0007】このような構造では、交互に位置する内外のリブにより底面壁の薄肉な周壁の曲げ強度が強化され、また厚肉の頂部にかかる内容物の荷重が最下段部の内縁と面内とに分散伝達されて、最下段部の内縁に対する荷重の集中が防止されることから、荷重による最下段部の外方への撓みが軽減される。

## 【0008】

【発明の実施の形態】図中1は胴部と一体の底部の周側壁、2は周側壁に接続した環状の接地周縁で接地面2aは平らに形成してあり、またそれらは0.2~0.3mm程度の薄肉に延伸成形されている。

30 【0009】3は上記接地周縁2により囲繞された底面壁で、底面を容器内に押し入れてドーム状に形成したものからなり、その周壁は最上段部4、中段部5、最下段部6の3つの段部に形成してある。

【0010】この底面壁3の頂部7は最上段部4まで2~3mm程の厚肉に形成されており、最上段部4から上記接地内縁にわたる周壁は、上記接地周縁2と略同様に薄肉に延伸成形してある。また薄肉の周壁には、頂部7から接地内縁と接続した最下段部6の内縁6aまで、比較

40 的幅狭(4mm程度)の4本の中空の外リブ8、8が等間隔にて放射状に設けてあり、各外リブ8、8の中間の底面壁には、外リブ8よりも幅広(5mm程度)で最上段部4から上記最下段部6の面内6bに達する長さの4本の中空の内リブ9、9がそれぞれ設けてある。

【0011】この内リブ9の容器内に臨むリブ面及び上記外リブ8の容器外に臨むリブ面は平坦面に形成され、それにより内外のリブ8、9は底面壁3の周壁に対して交互に位置して、周壁を一定間隔ごとに縦に区画し、最上段部4から下側の薄肉の周壁の曲げ強度を強化する一方、頂部7にかかる内容物の荷重を最下段部6の内縁6

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aと面内6 bとに分散して伝達し、最下段部6の内縁6 aに対する荷重の集中を防止している。

【0012】ドーム状に凹入形成された底面壁にかかる内容物の荷重は、最下段部6の内縁6 aに集中する。この内縁6 aの荷重の集中より最下段部6の張り出し面が接地内縁との接続境界を支点として下方へ撓む。この撓みは張り出し面の長さが短い場合、換言するならば幅狭の場合には撓みが生じても、接地面2 aから下側に飛び出することはないので、撓みによる接地障害は生じないが、幅広の最下段部6では撓み易く、撓み量も増すので接地面2 aよりも下側に飛び出して容器の座りが悪くなる。また飛び出すほどの撓みは生じないとしても、撓み量の大きさにより底部における内容積の変動が大きく、容器内の内容物の水位の低下を招く。

【0013】しかしながら、底面壁にかかる内容物の荷重、特に頂部7にかかる荷重を内外のリブ8、9により最下段部6の内縁6 aと面内6 bとに分散伝達するようにしたこの発明では、内縁6 bに対する荷重の集中が軽減され、また内リブ9が撓み支点となる接地内縁との境界近くに内リブ9の下端が位置して支え、その間のスパンも部分的ではあるが短く形成されるので、最下段部6が幅広に形成されたものであっても、撓みによる最下段部6の飛び出しは勿論のこと、大幅な水位の低下を招く変形も生じ難いものとなる。

【0014】したがって、周側壁1とドーム状の底面壁3との間隔を広く設定し、底面壁3の最下段部6を幅広\*

\*に形成して、接地周辺2から底面壁3にわたる底部を薄肉に延伸形成しても、最下段部6の荷重による底面壁の飛び出しなく、衝撃にも充分に耐えるようになる。また構造としても少なくとも各3本の中空のリブ8、9を、周壁の内外に交互に形成するだけでよいか簡単であり、成形に用いる金型の構造も特に複雑となるようなこともない。

【図面の簡単な説明】

【図1】この発明に係る薄肉合成樹脂ボトル等の容器の底部構造の下面図である。

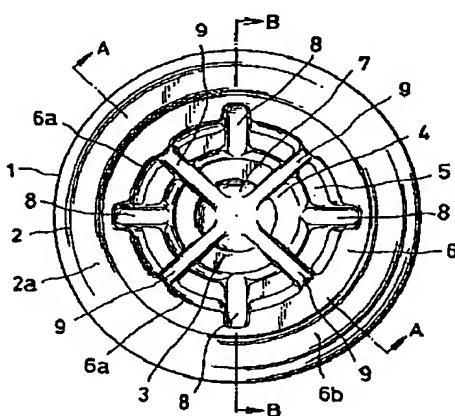
【図2】図1のA-A線断面図である。

【図3】図1のB-B線断面図である。

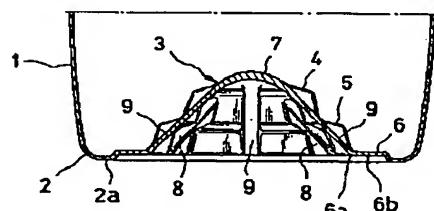
【符号の説明】

1	周側壁
2	接地周縁
2 a	接地面
3	底面壁
4	最上段部
6	最下段部
20	中段部
5	最下段部の内縁
6 a	最下段部の面内
6 b	頂部
7	外リブ
8	内リブ
9	

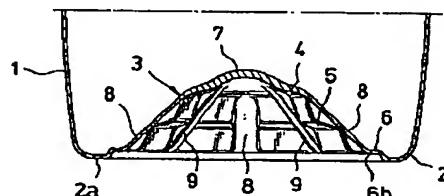
【図1】



【図2】



【図3】



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## CLAIMS

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## [Claim(s)]

[Claim 1] And it consists of a base wall in which the peripheral wall was formed to two or more steps. the base surrounded by the touch-down periphery and its touch-down periphery of the thin meat linked to the circumferential side attachment wall of a drum section and one -- the inside of a container -- pushing -- putting in -- the shape of a dome -- While forming the top thickness of the base wall heavy-gage to the maximum upper case section, extension formation of the peripheral wall ranging from the maximum upper case section to a touch-down common-law marriage is carried out like the above-mentioned touch-down periphery and abbreviation at thin meat. While preparing a rib in the common-law marriage of the bottom section at equal intervals outside at least three comparatively narrow hollow from the crowning at a radial Pars-basilaris-ossis-occipitalis structure of containers, such as a light-gage synthetic-resin bottle characterized by coming to prepare the inner rib in the air which is broader than the rib outside this to the middle peripheral wall of each \*\* rib, and reaches in the field of the maximum upper case section to the bottom section, respectively.

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the pars-basilaris-ossis-occipitalis structure of the synthetic-resin container of thin meat, such as a PET bottle by extension blow molding.

[0002]

[Problem(s) to be Solved by the Invention] Although [ the synthetic-resin container of thin meat, such as a bottle manufactured by extension blow molding, ] reinforcement increases on thin meat, so that extension shaping is carried out, it is technically made difficult to fabricate the whole base wall on thin meat. Moreover, since it has flexibility even if it is able to fabricate on thin meat, in a flat side, it bends according to the load of contents, and stability worsens and will become unstable.

[0003] Then, although he is trying to distribute around a base the load of the contents which join a base wall while pushing a base wall in the shape of a dome into a container and forming a ground plane annularly If peak top \*\* of a dome is enlarged, the content volume of a pars basilaris ossis occipitalis will decrease. By moreover, narrowing of spacing of a circumferential side attachment wall and a base wall Since light-gage shaping of the base periphery ranging from the touch-down circumference to a base wall becomes difficult, formation of a dome-like base wall is made as small as possible, and can be made to carry out extension shaping of the periphery at the bottom at thin meat.

[0004] Moreover, the peripheral wall was formed in the multistage section for the thinning of a base wall, and as bending prevention by the load, the longitudinal rib was really fabricated to the peripheral wall of thin meat, and is reinforced at it at the radial. Although this rib also prevents bending of the bottom section formed in the flatness of a base wall Since the old reinforcing rib is formed in per maximum upper case section from the common-law marriage of the bottom section, even if its span between touch-down common-law marriages is effective in bending prevention of the short bottom section narrow The effectiveness receives a limit in the die length of a span, and the bottom section of a bottom wall side jumps out of a ground plane to the down side in many cases, without supporting bending and going out in the broad bottom section. moreover, the water level of the contents in a container since content volume increases by bending even if the bending is the thing of the range settled in a ground plane -- a setup -- water level -- falling -- seemingly -- coming out -- since lack of capacity will be impressed to a consumer, it is supposed that it is not desirable.

[0005] By this invention solving the above-mentioned conventional technical problem, that purpose is in offering the pars-basilaris-ossis-occipitalis structure of containers, such as a new light-gage synthetic-resin bottle which can prevent bending by the load with those ribs, even if the bottom section is broadly formed by preparing a rib in the air in the peripheral wall of a dome-like base wall by turns from inside and outside.

[0006]

[Means for Solving the Problem] The touch-down periphery of the thin meat which connected this invention for the above-mentioned purpose to the circumferential side attachment wall of a drum section and one, the base surrounded by the touch-down periphery -- the inside of a container -- pushing -- putting in -- the shape of a dome -- and, while consisting of a base wall in which the peripheral wall was formed to two or more steps and forming the top thickness of the base wall heavy-gage to the maximum upper case section Extension formation of the peripheral wall ranging from the maximum upper case section to a touch-down common-law marriage is carried out like the above-mentioned touch-down periphery and abbreviation at thin meat. While preparing a rib in the common-law marriage of the bottom section at equal intervals outside at least three comparatively narrow hollow from the crowning at a radial, it is broader than the rib outside this to the middle peripheral wall of each \*\* rib, and comes to prepare the inner rib in the air which reaches in the field of the maximum upper case section to the bottom section, respectively.

[0007] the internal and external rib located by turns with such structure -- a base wall -- thin -- since the distributed

transfer of the load of the contents which the flexural strength of a \*\*\*\* peripheral ~~is~~ is strengthened, and start a heavy-gage crowning is carried out the common-law marriage of the bottom section, ~~and~~ into a field and concentration of the load over the common-law marriage of the bottom section is prevented, bending by the way is mitigated outside the bottom section by the load.

[0008]

[Embodiment of the Invention] Ground-plane 2a is formed in Taira and others in the annular touch-down periphery which connected one in drawing to the circumferential side attachment wall of a drum section and the pars basilaris ossis occipitalis of one, and connected 2 to the circumferential side attachment wall, and extension formation of them is carried out at about 0.2-0.3mm thin meat.

[0009] It consists of what 3 was the base wall surrounded by the above-mentioned touch-down periphery 2, and pushed the base into the container and was formed in the shape of a dome, and the peripheral wall is formed in three steps, the maximum upper case section 4, the inside step 5, and the bottom section 6.

[0010] To the maximum upper case section 4, it is formed heavy-gage and the about 2-3mm peripheral wall ranging from the maximum upper case section 4 to the above-mentioned touch-down common-law marriage has carried out extension formation of the crowning 7 of this base wall 3 like the above-mentioned touch-down periphery 2 and abbreviation at thin meat. moreover, in the peripheral wall of thin meat, to common-law marriage 6a of the bottom section 6 connected with the touch-down common-law marriage from the crowning 7 Ribs 8 and 8 are formed in the radial at equal intervals outside four comparatively narrow (about 4mm) hollow. In the middle base wall of each \*\* ribs 8 and 8 the outside rib 8 -- being broad (about 5mm) -- the inner ribs 9 and 9 of four hollow of the die length which reaches 6within field b of the maximum upper case section 4 to the above-mentioned bottom section 6 are formed, respectively.

[0011] The rib side which faces out of the container of the rib side which faces in the container of this inner rib 9, and the rib 8 outside the above is formed in a flat side, and the internal and external ribs 8 and 9 are located by turns to the peripheral wall of the base wall 3 by that cause. While dividing a peripheral wall perpendicularly for every fixed spacing and strengthening the flexural strength of the peripheral wall of lower thin meat from the maximum upper case section 4, the load of the contents concerning a crowning 7 was distributed and transmitted to common-law marriage 6a of the bottom section 6, and 6within field b, and concentration of the load over common-law marriage 6a of the bottom section 6 is prevented.

[0012] The load of the contents concerning the base wall by which reentrant formation was carried out is concentrated on the shape of a dome at common-law marriage 6a of the bottom section 6. From concentration of the load of this common-law marriage 6a, the overhang side of the bottom section 6 uses a connection boundary with a touch-down common-law marriage as the supporting point, and it bends below. When this bending has the short die length of an overhang side, if it puts in another way, even if bending will arise in a narrow case, since it does not jump out of ground-plane 2a to the down side, the touch-down failure by bending is not produced, but since it is easy to be bent by the broad bottom section 6 and the amount of bending also increases, it jumps out below ground-plane 2a, and the stability of a container worsens. Moreover, though not generated, with the magnitude of the amount of bending, fluctuation of the content volume in a pars basilaris ossis occipitalis is large, and, as for bending to the extent that it jumps out, causes the fall of the water level of the contents in a container.

[0013] however, by this invention that was made to carry out distributed transfer with the internal and external ribs 8 and 9 at common-law marriage 6a of the bottom section 6, and 6within field b, the load of the contents concerning a base wall, especially the load concerning a crowning 7 Although the lower limit of the inner rib 9 is located near the boundary with the touch-down common-law marriage which concentration of the load over common-law marriage 6b is mitigated, and the inner rib 9 bends, and serves as the supporting point, it supports and a span in the meantime is also partial, since it is formed short Even if the lowest edge 6 is formed broadly, it is hard to produce the deformation which causes the fall of large water level not to mention the elutriation of the bottom section 6 by bending.

[0014] Therefore, spacing of the circumferential side attachment wall 1 and the dome-like base wall 3 is set up widely, the bottom section 6 of the base wall 3 is formed broadly, and even if it carries out extension formation of the pars basilaris ossis occipitalis ranging from the touch-down circumference 2 to the base wall 3 at thin meat, there is no elutriation of the base wall by the load of the bottom section 6, and it also fully comes to bear an impact. The structure of the metal mold used for shaping also seems moreover, for it to be easy since what is necessary is just to form the ribs 8 and 9 of three hollow each within and without a peripheral wall by turns at least also as structure, and not to become complicated especially.

[Translation done.]

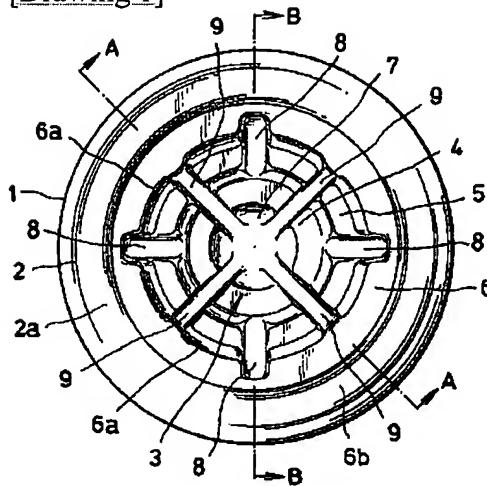
## \* NOTICES \*

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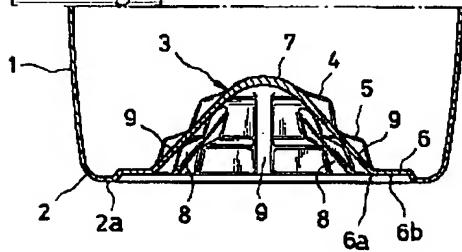
1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

## DRAWINGS

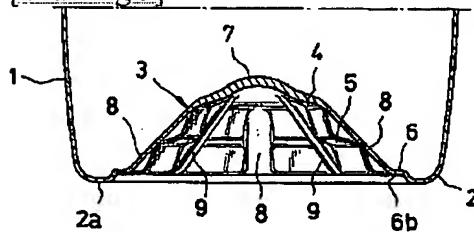
## [Drawing 1]



## [Drawing 2]



## [Drawing 3]



[Translation done.]